

Amendments to the Drawings:

The drawings are objected to under 37 C.F.R. § 1.83(a). The attached replacement sheet of drawings includes changes to FIG. 2A and replaces the original sheet including FIG. 2A. In FIG. 2A, a representative fan has been added to this figure to show an air circulating fan matched to a space between adjacent boards. In addition, FIG. 2A has been amended to show a valve controller operated by a common control system as the fan controller. Applicant respectfully submits that these additions to FIG. 2A add no new matter but merely more accurately illustrate the Application's description of the computing facility 100 and components thereof.

Attachments following last page of this Amendment:

Replacement Sheet (1 page(s))

Annotated Sheet Showing Change(s) (1 page(s))

### REMARKS

This Application has been carefully reviewed in light of the Office Action mailed on August 14, 2008 ("Office Action"). Claims 34-55 are pending in the Application and stand rejected. Claims 1-33 have been cancelled. Claims 36, 43 and 49-55 have been amended.<sup>1</sup> Claim 56 is new. Applicant respectfully requests reconsideration and favorable action in this case.

### Claim Objections

The Office Action objected to claims 45-54 because claim 45 was listed twice. Applicant thanks the Examiner for this notification. The appropriate numerical correction to claims 45-54 has been made, thereby resulting in pending claims 34-55 and new claim 56. Accordingly, Applicant respectfully requests that the objections to these claims be withdrawn.

### Drawing Objections and Claim Rejections – 35 U.S.C. § 112, ¶ 1

The Office Action objected to the drawings under 37 C.F.R. § 1.83(a) for failing to show every feature of the invention specified in the claims. FIG. 2A has been amended to show an air circulating fan matched to a space between adjacent boards and a valve controller operated by a common control system as the fan controller. Applicant respectfully submits that the foregoing amendments to FIG. 2A do not add new matter but merely more accurately illustrate the description of computer system 100 and the components thereof.

In addition, claims 39 and 52<sup>2</sup> stand rejected under 35 U.S.C. § 112, ¶ 1, as failing to comply with the written description requirement. The test under the written description requirement under § 112, ¶ 1 is "whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession of the invention as now claimed." M.P.E.P. § 2163(I)(B). Applicant submits that under the proper test of § 112, claims 39 and 52 have written description support in the Application as filed.

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<sup>1</sup> Applicant respectfully submits that certain amendments to claims 50-55 are merely technical and correct the dependencies of these claims previously in error due to the misnumbering of the claims noted in the Office Action. Support for additional amendments to claims 36, 43, and 49-50 may be found at, for example, FIG. 1; [0025]; [0033]-[0035]; [0045].

<sup>2</sup> Claim 52 has been renumbered from claim 51.

Specifically, claims 39 and 52 recite “air circulation fans . . . matched to a space between adjacent boards” and “matching each of the fans to a space between adjacent computer boards,” respectively. Applicant respectfully disputes that these features of claims 39 and 52 add new matter and submits that at least paragraphs 34-35 and 45 of the Application, as filed,<sup>3</sup> support these claim features, as well as the amendment to FIG. 2A. For example, paragraph 34 discloses that:

the heat exchange apparatus 110 is *interposed into the air flow path of the individual rack mounted computer systems* immediately before the cooling air flows past the area to be cooled, i.e., the shelves in the rack 104. . . . Because most or all the cooling air is pulled past the heat exchange apparatus 110 and then immediately pulled and/or pushed *across the components to be cooled*, the opportunity for hot exhaust air to re-circulate and mix with the chilled air is also minimized.

Application at [0034] (emphasis added). Moreover, the Application makes clear that “a closed-loop servo system utilizing existing components, circuits, and/or software of each rack mount computer system may be employed to control the air flow rate *by controlling the speed of the fans provided on each computer system tray.*” *Id.* at [0035] (emphasis added). Further, paragraph 45 discloses that “the *fans* of the computer system operate to pull air from the available ambient air within the computing facility past the heat exchange device to cool the air. . . . The *fans* then pull the cooled air *past the components of the computer system to cool the components.*” *Id.* at [0045] (emphasis added).<sup>4</sup> Applicant submits that, based on the foregoing disclosure at least, one of ordinary skill in the art would have recognized that Applicant was in possession of the subject matter of claims 39 and 52 as of the filing date of the Application. Applicant therefore respectfully requests that the rejections of claims 39 and 52 under § 112 be withdrawn.

Claim 40 also stands rejected under § 112, ¶ 1. Claim 40 recites “a valve controller operated by a common control system as the fan controller.” Applicant respectfully disagrees with the Office Action’s assertion that there is no such corresponding description of these claimed features. “The subject matter of the claim need not be described literally (i.e., using the

<sup>3</sup> U.S. Patent Application Serial No. 10/816,585.

<sup>4</sup> See also Application at [0009] (“a fan disposed in each space to pull air through the inlet via the heat exchanger, to direct air past the electronic components mounted therein to cool the electronic components”).

same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement.” M.P.E.P. § 2163.02. The Application discloses that the air flow rates of the fans of the computer system trays may be controlled by controlling the speed of each fan. *See* Application at [0035]. Further, the Application discloses that the system 100 may include a thermostatically controlled valve. *See id.* at [0036]. As the Office Action recognizes, “[t]hese two control systems *may communicate with each other* to optimize the fan speed and the heat transfer fluid flow rate. Such control helps to minimize the flow of the cooled heat transfer fluid through the heat exchange apparatus 110 to achieve the proper cooling of the computer components.” *Id.* at [0037] (emphasis added). Applicant respectfully submits that the foregoing disclosure, *e.g.*, the described communication between the control systems of the fans and valve, would convey with reasonable clarity to one of ordinary skill in the art that Applicant had possession of the subject matter of claim 40, namely, “a valve controller operated by a common control system as the fan controller,” as of the filing date of the Application, since such communication would indicate that they are part of a common system. Accordingly, Applicant respectfully requests that the rejection of claim 40 under § 112 be withdrawn. In light of the Office Action’s concession that the relied upon references fail to teach or suggest this claim, *see* Office Action at ¶ 11, Applicant respectfully requests allowance of claim 40.

### **Claim Rejections – 35 U.S.C. § 112, ¶ 2**

Claims 39 and 40 stand rejected under § 112, ¶ 2 as being indefinite. Specifically, the Office Action alleges that these claims are indefinite for having no corresponding drawing or description in the Application. Applicant respectfully submits that the amendments made to FIG. 2A, supported by the Application as explained above, overcome these rejections. Accordingly, Applicant respectfully requests withdrawal of this rejection of claims 39 and 40.

### **Section 103 Rejections**

The Office Action rejects the claims under 35 U.S.C. § 103(a):

- Claims 34-36, 38-39, 43-45, 49-50, 52 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication 2004/0100770 to Chu *et al.* (“Chu”) in view of U.S. Patent Application

Publication 2003/0053293 to Beitelmal *et al.* (“*Beitelmal*”).

- Claims 37, 46 and 51 are rejected under § 103(a) as being unpatentable over *Chu* in view of *Beitelmal* and further in view of U.S. Patent No. 5,740,018 to Rumbut, Jr. (“*Rumbut*”).
- Claims 41 and 47 are rejected under § 103(a) as being unpatentable over *Chu* in view of *Beitelmal* and further in view of U.S. Patent No. to Laffranchi (“*Laffranchi*”).
- Claims 42, 48 and 55 are rejected under § 103(a) as being unpatentable over *Chu* in view of *Beitelmal* and further in view of U.S. Patent No. 6,407,567 to Etter (“*Etter*”).
- Claim 53 is rejected under § 103(a) as being unpatentable over *Chu* in view of *Beitelmal* and further in view of U.S. Patent No. 6,530,347 to Takahashi *et al.* (“*Takahashi*”).
- Claim 54 is rejected under § 103(a) as being unpatentable over *Chu* in view of *Beitelmal* in view of *Takahashi* and further in view of *Laffranchi*.

Applicant respectfully traverses the rejections and all the assertions and holdings therein, because the above cited art, whether individually or in combination, fails to teach, suggest, or disclose various aspects of the present claims.

***Chu* Fails to Teach or Suggest “Open First and Second Sides Permitting Fluid Communication Across the Computer Boards to an Exterior of the Rack Structure”**

Claim 34 stands rejected under § 103(a) as unpatentable over *Chu* in view of *Beitelmal*. The Office Action relies solely on *Chu*, and more specifically, Figure 3 of this reference, to allegedly show “the rack structure having open first and second sides permitting fluid communication across the computer boards to an exterior of the rack structure,” as recited in claim 34.<sup>5</sup> But the Office Action fails to show that *Chu*’s system, or any modification thereof, teaches or suggests at least this feature of claim 34. Figure 3 of *Chu* is “an exploded top view of the frame assembly” that is illustrated in its assembled state in Figure 2. *See Chu* at [0041] (emphasis added). The assembled frame assembly illustrated in Figure 2 of *Chu* includes an electronics frame 10 and a chilled air sub-frame 1102. *See id.* at [0040]; Fig. 2. Significantly, the fully assembled system includes a closed loop air flow 1101, which transfers heat from the

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<sup>5</sup> The Office Action concedes that *Beitelmal* is only relied upon to allegedly show a fan controller and its function. *See* Office Action at ¶ 11.

electronics 12 to the heat exchanger 21 by the airflow. *See id.* Thus, *Chu* teaches that conditioned *recirculated* air is used to cool the electronic components within the enclosed frame assembly. Not only does the Office Action fail to show that the purported rack structure of *Chu* has the claimed “open first and second sides permitting fluid communication across the computer boards to an exterior of the rack structure,” the relied upon disclosure expressly teaches that such structure utilizes a closed loop heat exchange process without a need (or indeed desire) for this claimed feature.

Additional disclosure in *Chu* confirms that this reference fails to teach “open first and second sides permitting fluid communication across the computer boards to an exterior of the rack structure.” For example, Fig. 6, showing a top view of one embodiment of *Chu*’s system, illustrates doors 31 and 32 that enclose the frame assembly to form a closed-loop air circulation system. *See Chu* at Fig. 6. That *Chu* does not disclose such a feature is not surprising given the teachings of this reference. More specifically, *Chu* is explicitly directed to the problems associated with cooling air exiting a rack structure to its exterior, the very feature of claim 34 discussed herein:

However, this approach is becoming unmanageable at the frame level in the context of the computer installation (i.e. data center). **The sensible heat load carried by the air exiting the frame will eventually exceed the ability of the room air conditioning to effectively handle the load.** This is especially true for large installations with “server farms” or large banks of computer frames close together. In such installations not only will the room air conditioning be challenged, but the situation may also result in recirculation problems with some fraction of the “hot” air exiting one frame being sucked into the air inlets of a nearby frame.<sup>6</sup>

For at least the foregoing reasons, Applicant requests reconsideration and allowance of claim 34 and all claims depending therefrom. Claims 43 and 49 include certain aspects analogous to claim 34. Applicant therefore also requests reconsideration and allowance of claims 43 and 49 and all claims depending therefrom.<sup>7</sup>

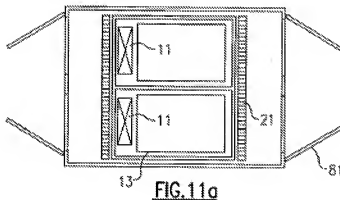
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<sup>6</sup> *Chu* at [0003] (emphasis added).

<sup>7</sup> Applicant respectfully disputes the Office Notice of the conventionality of mounting boards with or without containers on shelves within a rack structure. *See id.* at page 7 (regarding claim 39). “Official notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known,” M.P.E.P. § 2144.03(A). “It would not be appropriate for the examiner to take official notice of facts without citing a

**The *Chu-Beitelmal* Combination Fails to Teach or Suggest One or More Rack Structures Accessible From a Central Aisle**

Claim 43 stands rejected under § 103(a) in view of the *Chu-Beitelmal* combination. Applicant respectfully submits that claim 43 is allowable over this combination for at least the reasons given above. In addition, amended claim 43 is allowable because the *Chu-Beitelmal* combination fails to teach or suggest “a central aisle . . . wherein the open front side of each rack is accessible from the aisle.” See Office Action at p.6 (referencing similar feature of claim 36). The Office Action appears to rely on the space between electronics drawers 13 as shown in Figure 11a of *Chu* (below) to purportedly teach or suggest the claimed “central aisle.”



*Chu*'s illustration of some space, or for that matter any space, between the electronics drawers 13 does not teach or suggest the full breadth of amended claim 43. The Office Action fails to show that the drawers 13 are accessible from the relied upon space, to say nothing of showing that the drawers 13 include “open front sides” accessible from this space. This deficiency in *Chu* is not insignificant. As the Application explains, “the heat exchange apparatus 110 may be installed such that the individual computer system shelves *may be accessed or removed for repair or replacement without interference from the heat exchange apparatus 110.*” Application at [0033]. In other words, such accessibility may allow easier removal or repair of the heat generating components within the claimed rack structures. There is no indication in the

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prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known.” *Id.* Applicant submits that the conventionality of mounting boards with or without containers on shelves within a rack structure is not a fact “capable of instant and unquestionable demonstration as being well-known.”

Office Action that such a feature is available in or contemplated by *Chu*.

Accordingly, Applicant respectfully requests reconsideration and allowance of amended claim 43 and amended claims 36 and 50, which contain certain features analogous to claim 40.



### CONCLUSION

Applicant has made an earnest attempt to place this case in condition for allowance. However, the absence of a reply to a specific rejection, issue, or comment does not signify agreement with or concession of that rejection, issue, or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

If the present application is not allowed and/or if one or more of the rejections is maintained, Applicant hereby requests a telephone conference with the Examiner and further request that the Examiner contact the undersigned attorney to schedule the telephone conference.

Please apply the required fee of \$490. (Petition for Two-Month Extension of Time) and any other charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: January 14, 2009

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ANNOTATED SHEET

**2/6**

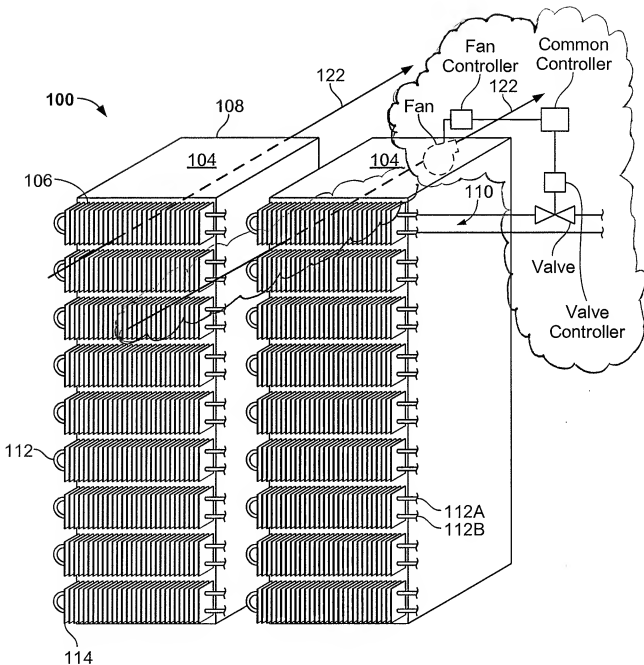


FIG. 2A